

## CLAIMS

1. A method of inspecting, for each cell, unevenness of a partition wall surface of a cylindrical honeycomb structure having a plurality of cells functioning as passages for fluid and separated from each other by partition walls,

the method comprising the steps of:

allowing a diffusion light to enter from one end face side of a honeycomb structure by a predetermined lighting means and to exit from the other end face side of the honeycomb structure after passing it through the inside of the cells,

allowing the exited diffusion light to pass through a translucent screen disposed on the other end face side of the honeycomb structure to act as a transmitted light,

projecting a transmitted image by means of the tone of the transmitted light onto the transmitted light side of the screen,

picking up the transmitted image projected on the screen by an imaging means, and

analyzing by an analyzing means the gray level of the obtained image to inspect for each cell the level of the surface unevenness of the partition walls of the honeycomb structure.

2. A method of inspecting unevenness of a partition wall surface of a cylindrical honeycomb structure according to Claim 1, wherein the screen is disposed so as to be in contact with the other end face side of the honeycomb structure.

3. A method of inspecting, for each cell, unevenness of a partition wall surface of a cylindrical honeycomb structure having a plurality of cells functioning as passages for fluid and separated from each other by partition walls,

the method comprising the steps of:

allowing a diffusion light to enter from one end face side of a honeycomb structure by a predetermined lighting means and to exit from the other end face side of the honeycomb structure after passing it through the inside of the cells,

allowing the exited diffusion light to be picked up by an imaging means  
 5 for each image from the direction perpendicular to the other end face of the honeycomb structure, and

analyzing by an analyzing means the gray level of the obtained image to inspect for each cell the level of the surface unevenness of the partition walls of the honeycomb structure.

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4. A method of inspecting unevenness of a partition wall surface of a cylindrical honeycomb structure according to any one of Claims 1 to 3, wherein the gray level of the image is analyzed by being subjected to a binary treatment with the analyzing means.

15 5. A method of inspecting unevenness of a partition wall surface of a cylindrical honeycomb structure according to any one of Claims 1 to 4, wherein a shadow generated by the partition walls in the image is removed before the gray level of the image is analyzed by the analyzing means.

20 6. A method of inspecting unevenness of a partition wall surface of a cylindrical honeycomb structure according to any one of Claims 1 to 5, wherein the diffusion light from the lighting means has an illuminance of 3000 Lux or more.

7. A method of inspecting unevenness of a partition wall surface of a cylindrical  
 25 honeycomb structure according to any one of Claims 1 to 6, wherein the screen has a light transmittance of 35 to 90%.

8. An inspecting device for inspecting, for each cell, unevenness of a partition wall surface of a cylindrical honeycomb structure having a plurality of cells functioning as

passages for fluid and separated from each other by partition walls, the inspecting device comprising:

a lighting means disposed on one end face side of the honeycomb structure and allowing a diffusion light to enter from one end face side of a honeycomb structure and to exit from the other end face side of the honeycomb structure after passing it through the inside of the cells,

a translucent screen disposed on the other end face side of the honeycomb structure, allowing the exited diffusion light to pass therethrough to obtain a transmitted light, and capable of projecting a transmitted image by means of the tone of the transmitted light onto the transmitted light side of the screen,

an imaging means for picking up the transmitted image projected on the screen, and

an analyzing means for analyzing the gray level of the image picked up by the imaging means to inspect for each cell the level of the surface unevenness of the partition walls of the honeycomb structure.

9. An inspecting device for inspecting unevenness of a partition wall surface of a cylindrical honeycomb structure according to Claim 8, wherein the screen is disposed so as to be in contact with the other end face side of the honeycomb structure.

10. An inspecting device for inspecting, for each cell, unevenness of a partition wall surface of a cylindrical honeycomb structure having a plurality of cells functioning as passages for fluid and separated from each other by partition walls, the inspecting device comprising:

a lighting means disposed on one end face side of the honeycomb structure and allowing a diffusion light to enter from one end face side of a honeycomb structure and to exit from the other end face side of the honeycomb structure after passing it through the inside of the cells,

an imaging means disposed on the other end face side of the honeycomb structure and allowing the exited diffusion light to be picked up for each cell from the direction perpendicular to the other end face of the honeycomb structure, and

an analyzing means for analyzing the gray level of the image picked up by the imaging means to inspect for each cell the level of the surface unevenness of the partition walls of the honeycomb structure from a result of analysis by the analyzing means.

11. An inspecting device for inspecting unevenness of a partition wall surface of a cylindrical honeycomb structure according to any one of Claims 8 to 10, wherein the gray level of the image is analyzed by being subjected to a binary treatment with the analyzing means.

12. An inspecting device for inspecting unevenness of a partition wall surface of a cylindrical honeycomb structure according to any one of Claims 8 to 11, wherein a shadow generated by the partition walls in the image is removed before the gray level of the image is analyzed by the analyzing means.

13. An inspecting device for inspecting unevenness of a partition wall surface of a cylindrical honeycomb structure according to any one of Claims 8 to 12, wherein the diffusion light from the lighting means has an illuminance of 3000 Lux or more.

14. An inspecting device for inspecting unevenness of a partition wall surface of a cylindrical honeycomb structure according to any one of Claims 8 to 13, wherein the screen has a light transmittance of 35 to 90%.